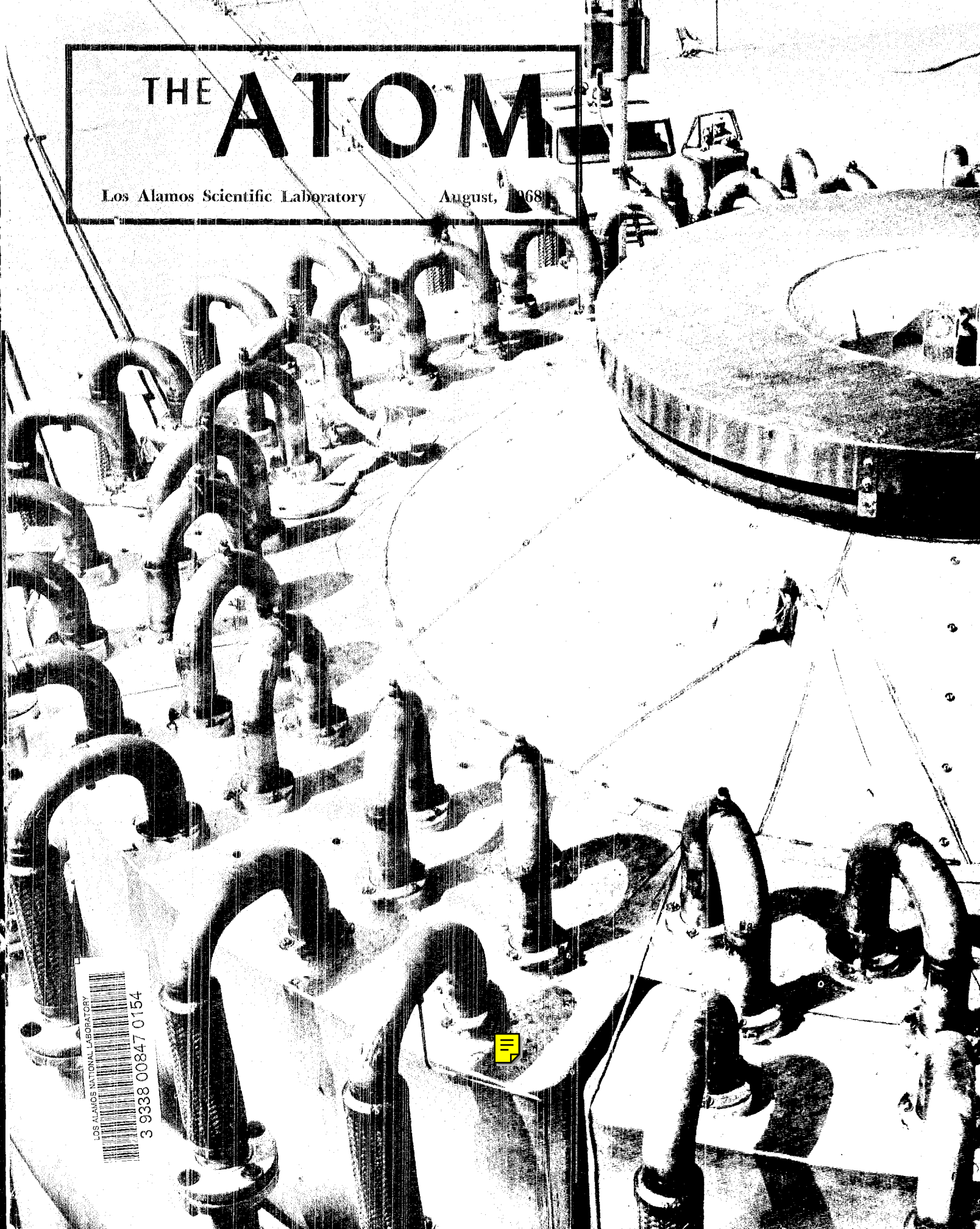
THE ATOM

Los Alamos Scientific Laboratory August, 1968



Volume 3 Number 8
August, 1968

THE ATOM

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CONTENTS:

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and Bill Regan

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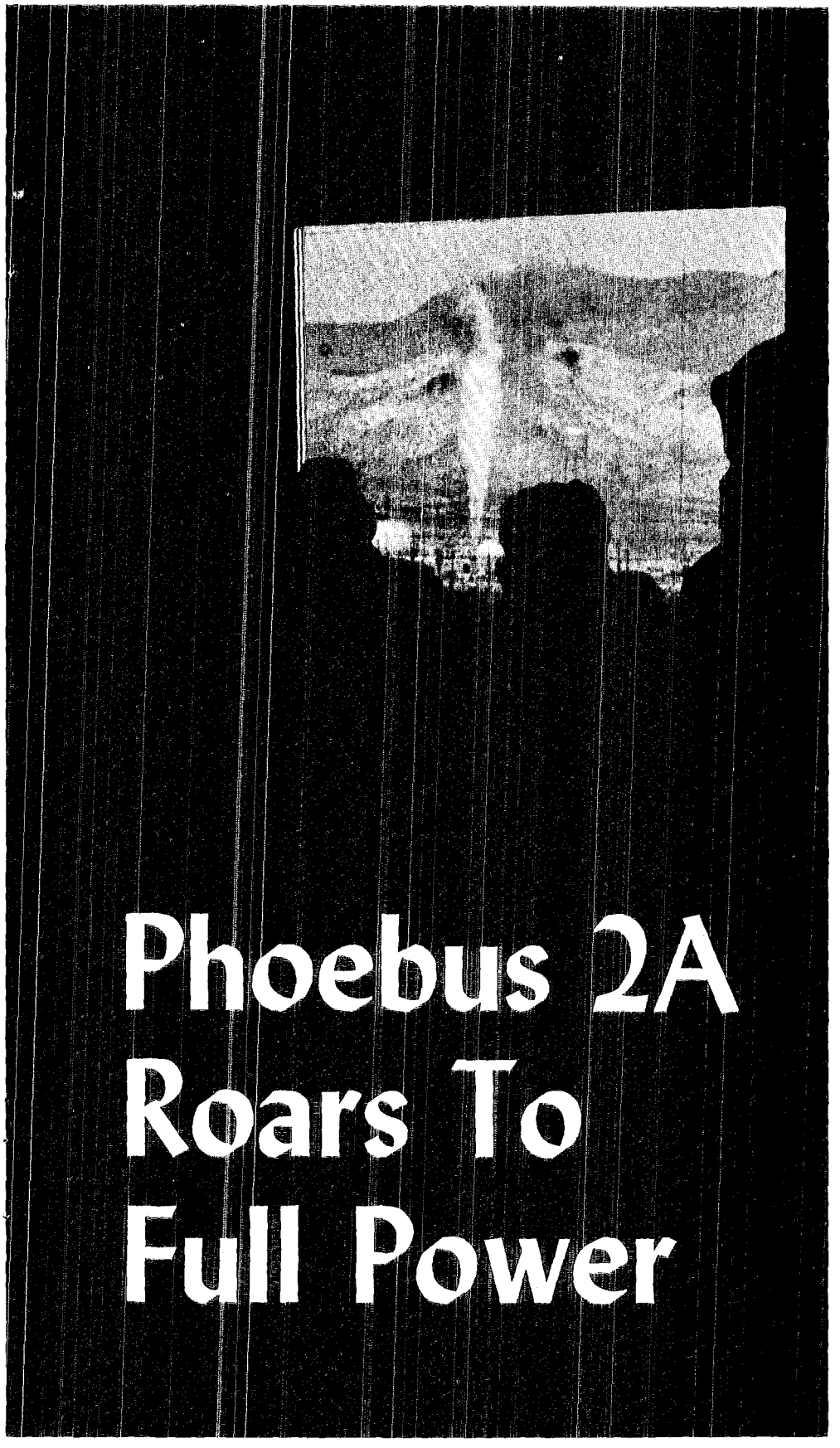
COVER:

Our cover this month is a topside look at the Phoebus 2A nuclear rocket reactor and shield, photographed by Pub-1 Photographer Bill Jack Rodgers. Borated water flows into the reactor shield through the many pipes seen in the photograph. The liquid serves as a coolant and "soaks up" radioactivity emitted by the reactor.



From a window in the control point, observers saw a fiery plume at Test Cell C, reaching toward the sky.

Phoebus 2A Roars To Full Power

A roar became audible in the gallery and several persons gave up their seats overlooking the control room for positions near a window.

Two miles away, at Test Cell C of the Nuclear Rocket Development Station in Nevada, they could see a fiery plume reaching almost 400 feet toward the sky.

Its origin was the Phoebus 2A, the most powerful nuclear rocket reactor ever developed, undergoing a full-power ground test. At its peak the reactor generated power of more than 4,000 megawatts and reached operating temperatures of nearly 2,000 degrees centigrade.

Those who were observing the test from windows in the command post or on television monitors in its gallery, were for the most part, Los Alamos Scientific Laboratory scientists and technicians. Many of them have witnessed tests of all 12 of LASL's nuclear rocket reactors designed and developed for Project Rover.

Project Rover was founded in 1955 as America's program to de-

continued on next page

The plume is contrasted against the sky as the Phoebus 2A operates at full power. D-8 used infrared film in taking this photograph.

Phoebus 2A . . .

continued from preceding page

velop a nuclear propelled rocket, capable of interplanetary travel. The program is administered by the Space Nuclear Propulsion Office under the joint sponsorship of the Atomic Energy Commission and the National Aeronautics and Space Administration.

The Phoebus 2A is a member of the third generation of Rover reactors. The first generation began with KIWI A, which was run at full power in July of 1959. It was followed by KIWI A′ a year later, and KIWI A-3 in October of 1960. Named after a flightless bird in New Zealand, these reactors were "pilot plants" capable of producing about 100 megawatts of heat power, which served as a basis for bigger and better reactors.

They were succeeded by five KIWI B reactors, comprising the second generation. The KIWI B-1A, tested in December of 1961, was the last reactor to use hydrogen gas under high pressure as a propellant. The KIWI B-1B was run in

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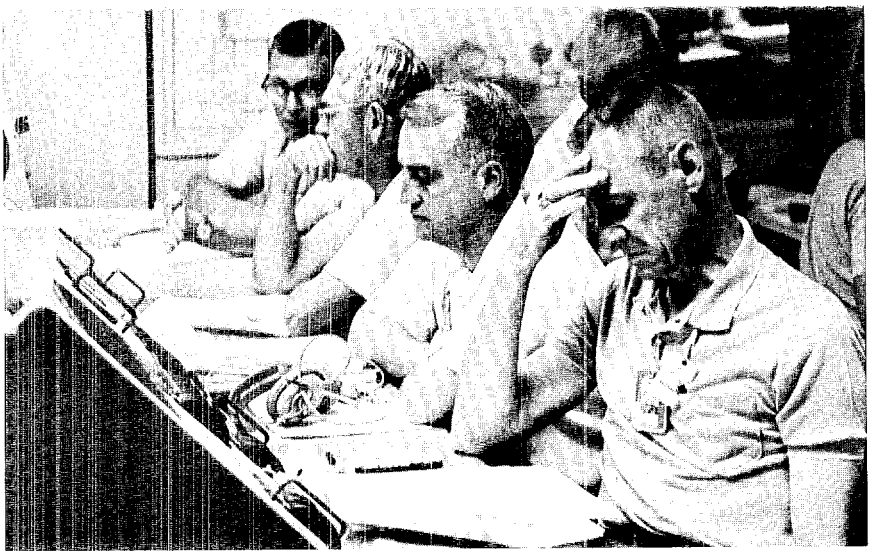
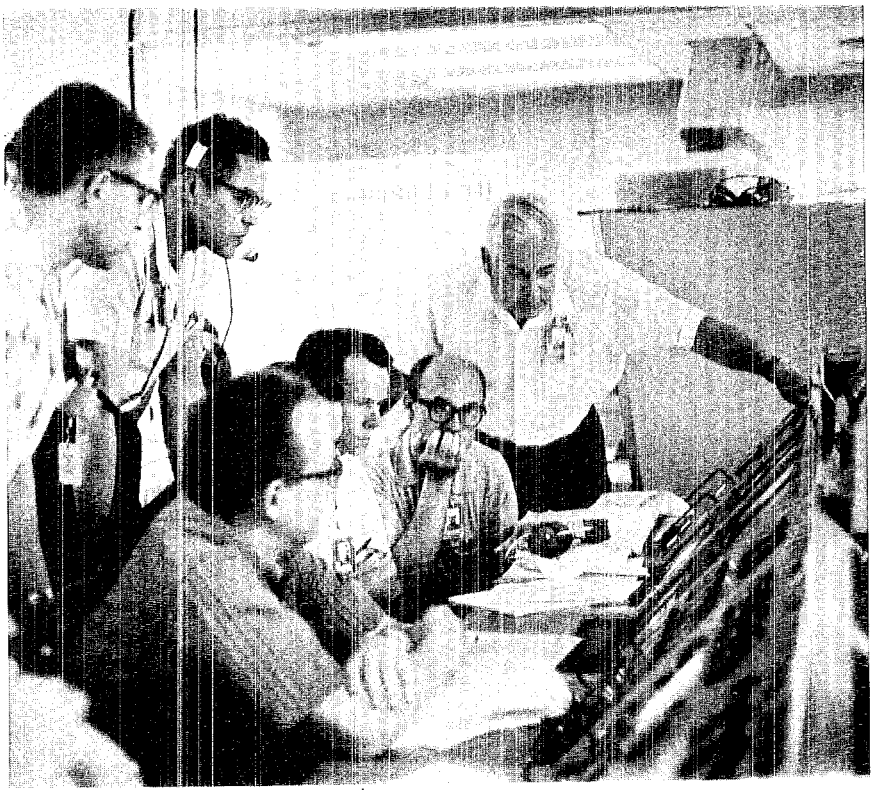
Data systems operators Donald Grosenick and Bob Bearden, both J-17, view the Phoebus 2A on a television monitor in the control room.

Phoebus 2A Is Tested Again

A third power run of Phoebus 2A was conducted at Jackass Flats on July 18. This run was devised to provide essential performance data for a wide range of operating conditions. In this test the reactor operated over a range of power levels up to 3,670 megawatts with a total operating time of about 30 minutes.

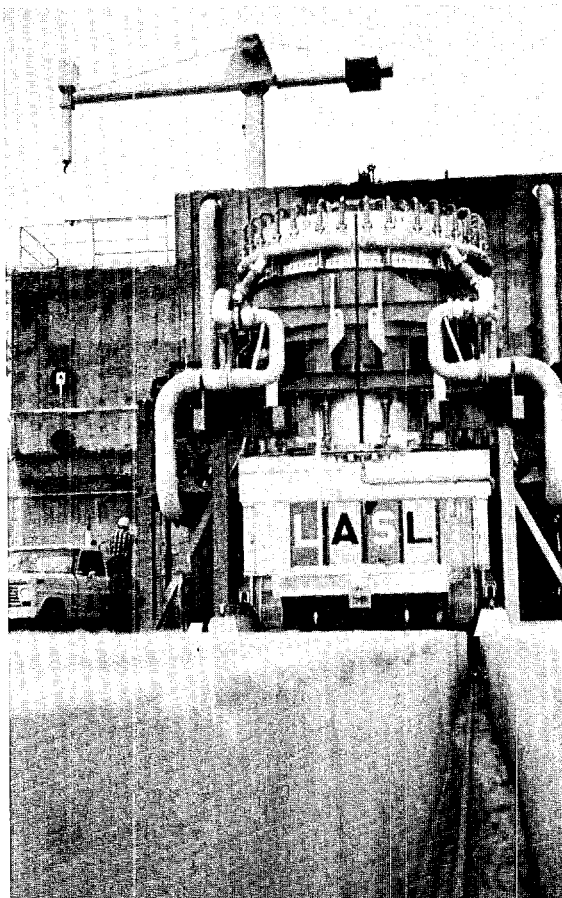


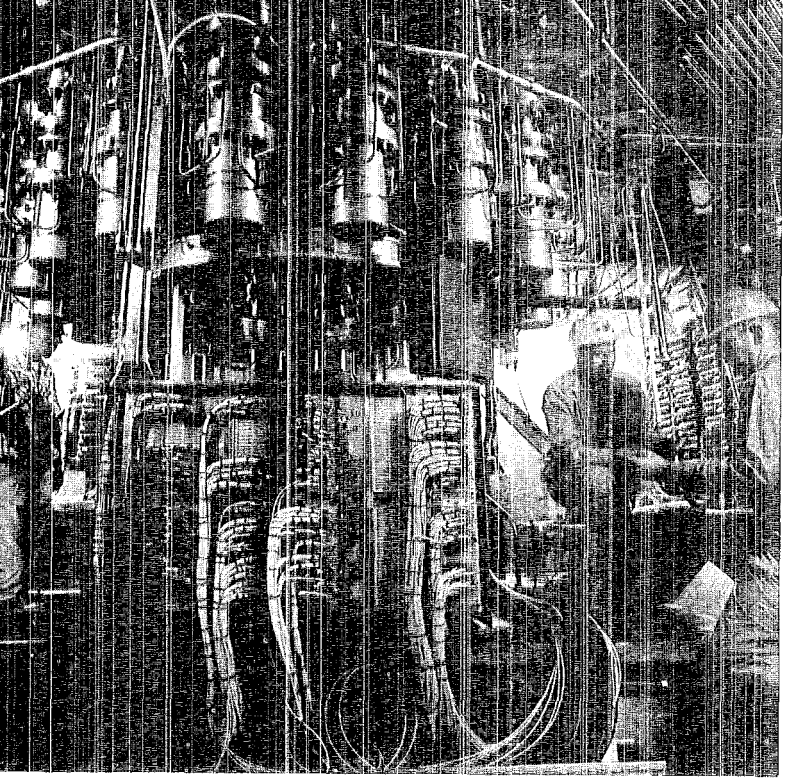
Following test checklists in the test monitor room are William Kirk, N-division coordinator for the Phoebus 2 and Pewee programs at LASL; Roderick Spence, N-division leader; Edward Brown, N-4 alternate group leader; and Vernon Zeigner, N-3 group leader.



In the test monitor room, adjacent to the control room, all eyes study the TV monitors. Standing are Ernest J. Bodensieck, Rocketdyne; James Henshall, test and J-17 group leader; and Keith Boyer, test director and associate J-division leader. Seated are Stanley Gunn, program manager for the nuclear rocket division of Rocketdyne; Murlin Nutter, J-18 (partially hidden by Gunn); Franklin Durham, alternate N-division leader; and Charles Fenstermacher, J-18 group leader.

The Phoebus 2A is shown at Test Cell C prior to a test. The cable in the trench is used to draw a shed over the reactor during inclement weather or at other times specified.

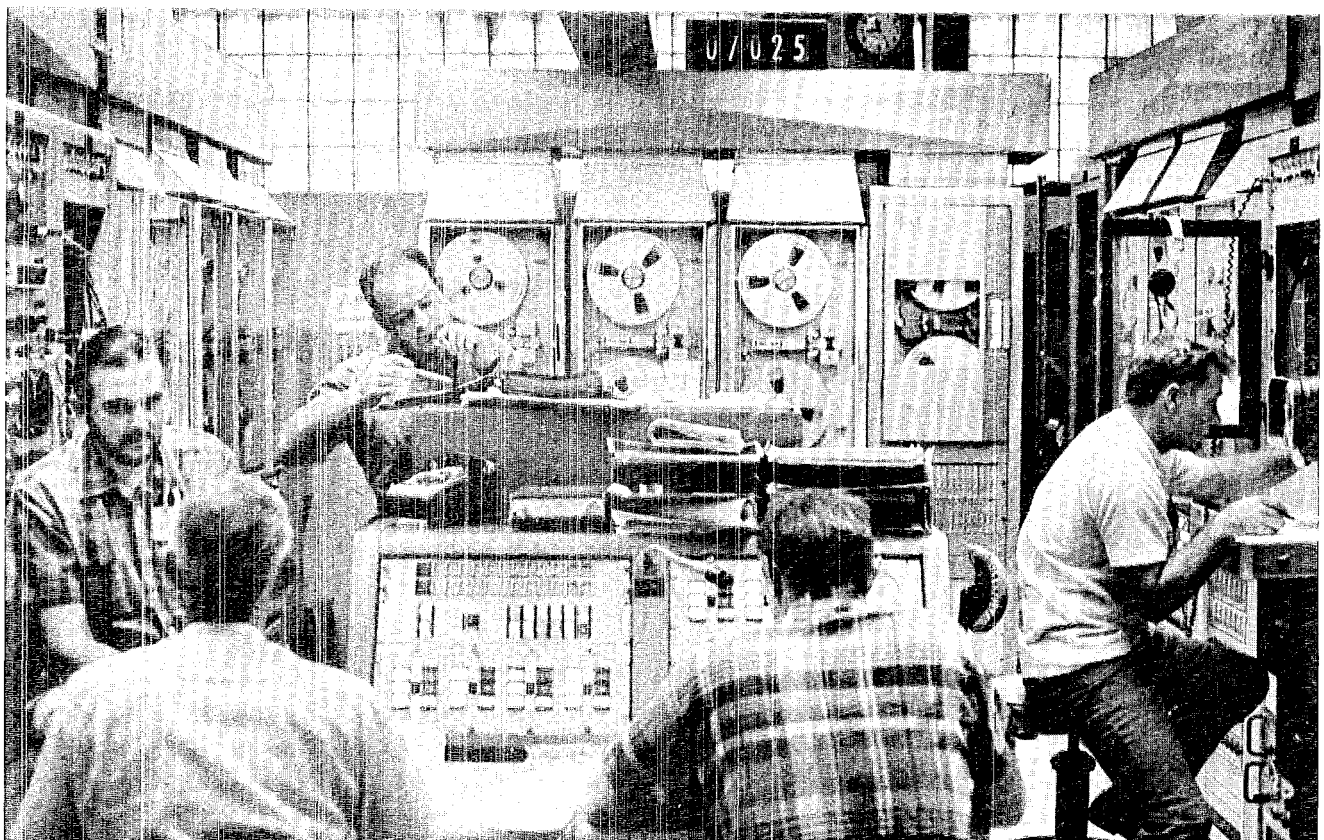


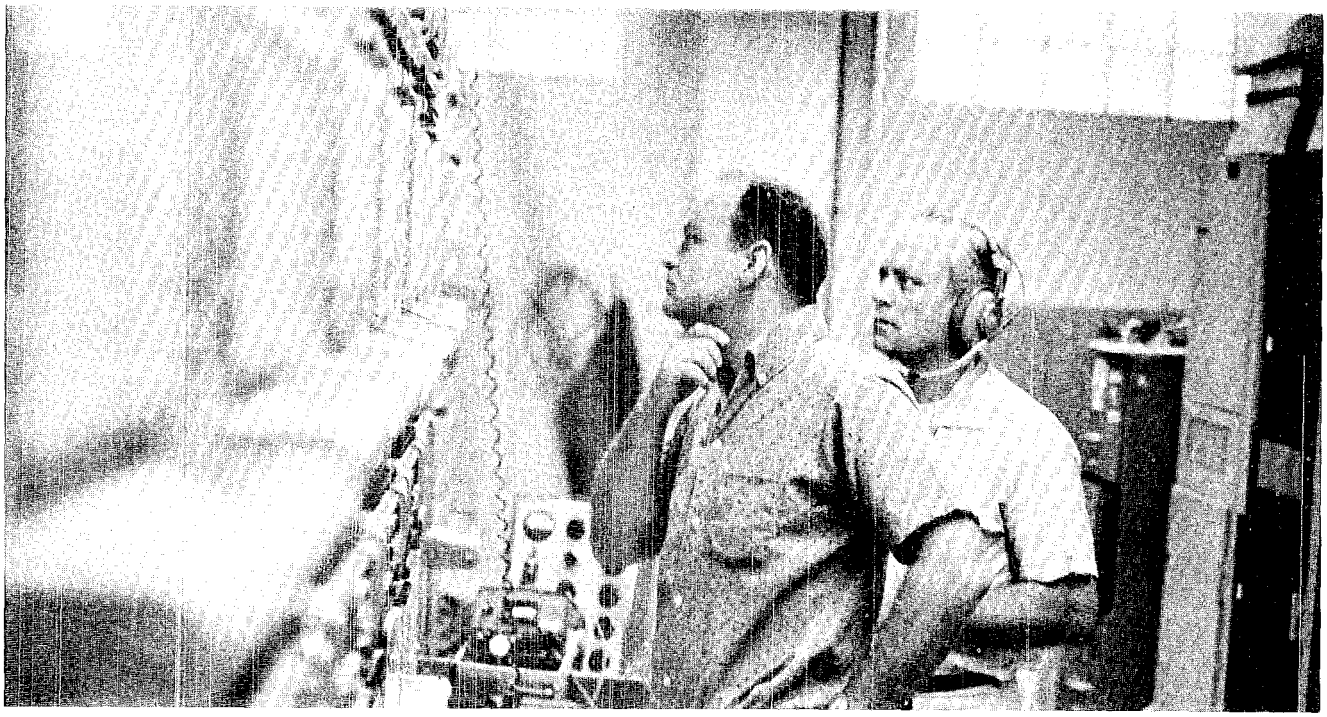


In the "privy," below the reactor, Barry Bortman, right, on loan to LASL by Pan Am, and William Skivington, J-9 radiology section, prepare to x-ray joints in tubing to determine the quality of welds. At left is Fred Siedentopf, also of J-9.

Robert Smith, J-17, observes an oscilloscope's translation of a test run.

Much information about a reactor test is "taped" by Ampex recorders. In addition to EG&G employes, in this photograph, are Robert Smith and Don Goetting, both J-17 (facing camera).





Robert Smith J-17, and Robert Turner, Nevada Test Operations, observe the operation of Sanborn recorders. The Sanborns provide a "quick look" profile of a test.

Phoebus 2A . . .

continued from page 2

September of 1962 and was the first to use pumped liquid hydrogen as a propellant. KIWI B-4A ran in November of 1962; KIWI B-4D in May of 1964; and KIWI B-4E in August of 1964. These reactors were 10 times more powerful than any in the first generation and served primarily as proof that the nuclear core being used was a sound investment.

After TNT, a reactor which was deliberately destroyed in January of 1965 to obtain basic reactor excursion information, the third generation of nuclear powered reactors was introduced. These were the Phoebus reactors, of which there were three, named after the god of sunlight, prophecy, and music and poetry in Greek mythology.

Phoebus 1A was tested in June of 1965; and little more than a year-

continued on next page

Studying a test profile of a Phoebus 2A test are John Rowley, N-7 group leader; Robert R. Holman, Westinghouse; and J. Douglas Balcomb, N-4.

Congratulating Test Director Keith Boyer on a successful full-power run of the Phoebus 2A is Milton Klein, head of the Space Nuclear Propulsion Office.

Phoebus 2A . . .

continued from preceding page

and-a-half later, Phoebus 1B established a power record of approximately 1,500 megawatts. This record, however, fell twice to the Phoebus 2A during June of this year. The first time was during an intermediate run June 8 when it achieved a power level of approximately 1,900 megawatts. The second time was during the full-power test June 26.

The Phoebus reactors were planned as "tools" to advance nuclear rocket technology. Basically, they incorporated significant advances over the KIWI's in terms of higher temperatures, higher power, longer life, and advanced design features —all of which are necessary for a flyable nuclear engine.

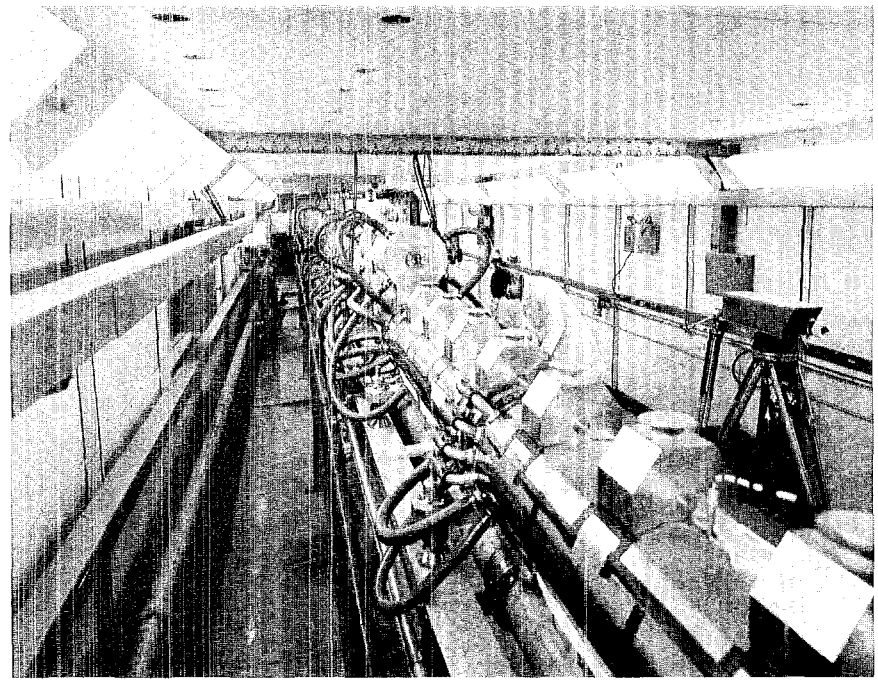
Based on 13 years of LASL technology, the reactor for a flyable nuclear engine is to be built by the Westinghouse Corporation's Astronuclear Laboratory. Aerojet General Corporation is responsible for incorporating the Westinghouse reactor in a nuclear engine, known as NERVA (Nuclear Engine for Rocket Vehicle Application).

The NERVA engine is not meant to lift a payload from a launch pad, but rather is to be the prime mover for missions beginning from an earth orbit. It will be put into orbit by a chemical rocket, which has a capability of considerably more thrust than its nuclear counterpart.

Current plans in Project Rover call for a shift of emphasis from reactor design to improving fuel elements for the NERVA system.

This shift is evidenced by a new series of smaller "testbed" reactors known as Pewees. Their primary purpose is to test core components after they are developed in the laboratories.

Experiments are being conducted now in a Kiva at Pajarito Site with Pewee I, the first of a planned series of five reactors. It is expected to be tested in Nevada this winter.



Walls, ceiling and floor, visible in this photograph of the Electron Prototype Accelerator "iron house," are built from huge metal slabs once used to form counterweights for Atlas F missile sites.

Missile Counterweights Make Great Building Material

Huge metal slabs, once used to form counterweights at Atlas F missile sites, are now being used by MP-division at Los Alamos Scientific Laboratory as radiation shielding for the Electron Prototype Accelerator and to build a warehouse.

The metal slabs were procured from the Air Force by LASL's supply and property department at salvage and transportation costs. They are intended for use as radiation shielding at the Los Alamos Meson Physics Facility, (LAMPF) now under construction.

However, until LAMPF is ready for them, they will continue to be used to form the 19x95-foot "iron house" that contains the Electron Prototype Accelerator (EPA) and the 38x126-foot warehouse on the "Kennedy Heliport Pad" south of wing nine of the CMR building.

As building material, the metal slabs are excellent. They are machined on two sides to a tolerance of within one mil so that when

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Counterweights . . .

continued from preceding page

stacked, they fit tightly against one another.

The use of missile counterweights for radiation shielding is not a new concept. The EPA iron house, built in early 1967, is the second of its type at LASL. The first iron house enclosed the Laboratory's Model L Accelerator. It was dismantled prior to the building of the second one. Other accelerator installations are also putting the counterweights to similar use.

The warehouse, however, is probably the first of its kind. The counterweights had to be stored somewhere; and MP-division capitalized on an idea, not only to store them, but to build a temporary storage facility from them. In the warehouse configuration the counterweights take up less space than if they were in piles.

Bringing the counterweights to Los Alamos was no "throw 'em on a truck and dump 'em in a storage yard" operation. Each counterweight weighed 250 tons, and was composed of several metal slabs of varying sizes. The largest were one foot thick, three feet-three inches wide, and 19 feet long, weighing approximately 14 tons. These were made of cast iron. Some of the smaller slabs were steel plate. The smallest were one-half of an inch thick, three feet-three inches wide, and nine feet long.

It took many trucks, equipped with "lowboys," "floating" and "bobtail" trailers to move the counterweights from their locations in Texas, Kansas and New Mexico. One truck-trailer rig, for example, often carried only one of the largest cast iron slabs. Loading and unloading operations required the use of large cranes.

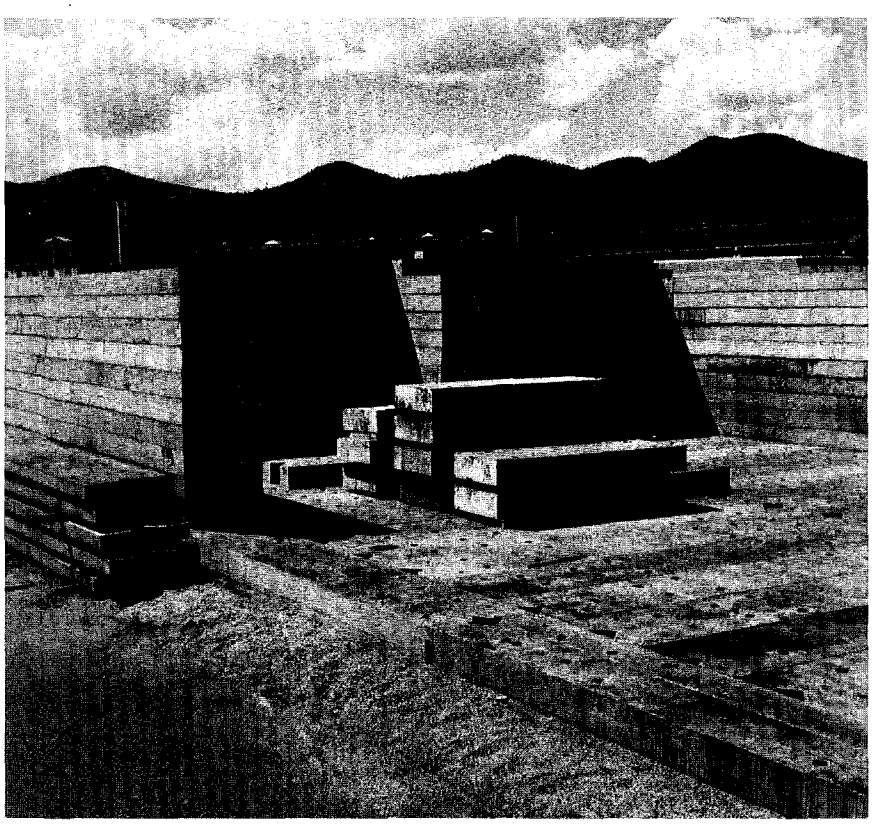
By purchasing the surplus counterweights, the Laboratory saved many thousands of dollars.

For example, if the counterweights had not been available, and concrete had been used as shielding material for the EPA, it has been estimated that the cost would have been $15,000 to $20,000 higher.

Likewise, a metal building of comparable size to the warehouse, would have been an estimated $39,000 higher.

The counterweights also represent considerable savings in the LAMPF project. Market value for shielding materials is much higher than the salvage and transportation costs for the counterweights.

The purchase was a sound investment for the Los Alamos Scientific Laboratory.



Under construction on the "Kennedy Heliport Pad" at the Los Alamos Scientific Laboratory is a 38x126-foot warehouse. The counterweights make an excellent building material.

LASL Looks At Two Proposed Plowshare Experiments

By Ken Johnson

Nuclear explosives may be used in the next decade for commercial exploitation of gas reservoirs and low-grade copper deposits not now economically productive using conventional techniques.

This depends in part on the success of two joint government-industry experiments which have been proposed under the auspices of the Plowshare Program, established by the Atomic Energy Commission in 1957 to investigate and develop peaceful uses for nuclear explosions.

R. H. Campbell, assistant J division leader at Los Alamos Scientific Laboratory and test director for both experiments, said the Laboratory is responsible for furnishing, emplacing and firing the nuclear devices; furnishing a scientific advisor to the AEC's Nevada Operations Office; and serving as a consultant in radiochemistry problems.

The experiments, known as Rulison and Sloop, would mark LASL's first entry into the industrial aspects of the Plowshare Program.

Rulison is a proposed experiment to demonstrate the feasibility of stimulating natural gas reservoirs which cannot be made economically productive using conventional techniques.

It was formally proposed to the Atomic Energy Commission by Austral Oil Company of Houston, Texas, with assistance from its nuclear advisors, CER Geonuclear of Las Vegas, Nevada, and the Lawrence Radiation Laboratory.

Austral, CER and the Department of Interior's Bureau of Mines are responsible for development of the reservoir evaluation portion of the technical program. The Bureau would also serve as liaison with other Department of Interior agencies on Rulison matters such as the acquisition of hydrologic and geologic data from the U.S. Geological Survey and the Land Usage permits, if required, from the Bureau of Land Management.

As presently conceived the project calls for a nuclear explosive device of approximately 40 kilotons to be detonated at a depth of about 8,000 feet.

Upon detonation, a large underground cavity will be formed. The roof over the cavity, fractured by shock wave, would collapse and a cylindrical chimney of broken rock would form upward. The explosion would also fracture rock out beyond the chimney boundary.

The gas-bearing rock is expected to be fractured in such a manner as to permit the gas to flow more freely and thus increase the rate of recovery.

It has been estimated that 50,000 acres at Rulison Field could produce eight trillion standard cubic feet of gas if stimulation is successful.

The site is near Rifle, Colorado. Representatives of the Los Alamos Scientific Laboratory and other government and industrial participants examined it and surrounding area on the second day of a two-day meeting in June. In addition to site examination, purpose of the meeting was to review the results of reservoir analysis and hydrologic tests made to date; and to discuss various concepts and requirements needed to advance project definition.

Those from LASL who visited the site were Paul Barbo, W-3; Robert Bradshaw, J-6; B. C. Lyon, J-1; James Wells, J-1; and Campbell.

Rulison is similar to Project Gasbuggy, the first joint government-industry experiment in the AEC's Plowshare Program. The Gasbuggy shot occurred near Farmington, New Mexico in 1967. However, Project Rulison will be attempted in a

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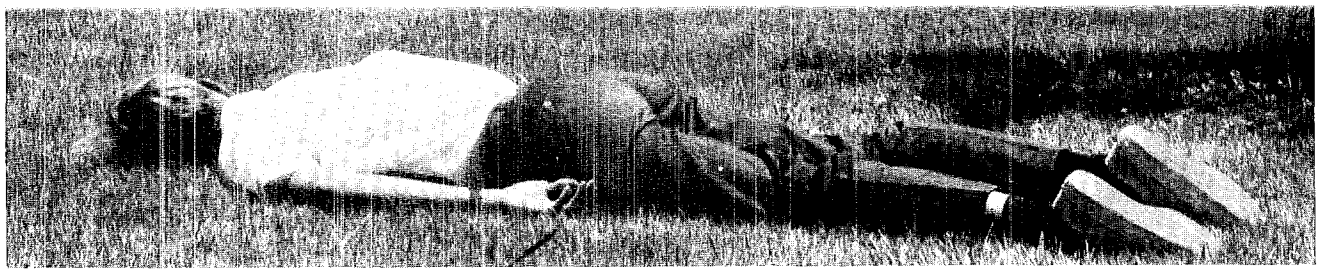
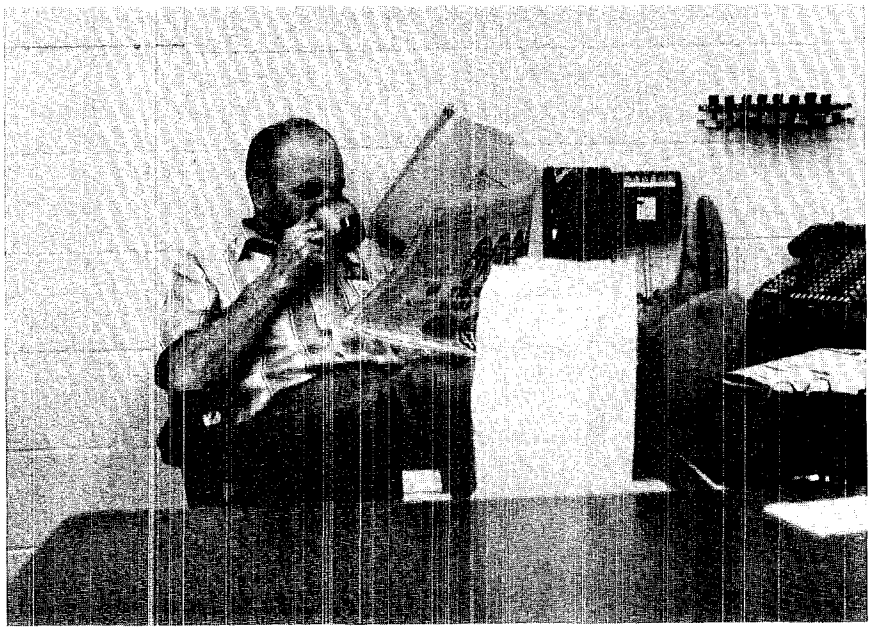


. . . plumb tuckered out, and the day is only half over.

During a LASL Lunch Hour

Leo Ortega, AO-6, is just one of many employes at the Los Alamos Scientific Laboratory who brings his lunch—and his newspaper.



The south lawn of the Administration building is a fine place for knitting up the poetic "ravell'd sleave of care" which Mary Evelyn Hibbetts, D-2, is doing—literally.

Construction Calms LASL'S "Growing Pains"

It took $5,470,000 to calm the "growing pains" of the Los Alamos Scientific Laboratory during the first 11 months of Fiscal Year 1968, and the amount will more than likely reach $6 million when construction costs for the month of June are added.

More than $3 million in major construction projects were completed during the past fiscal year. These included projects that were started prior to July 1, 1967.

The largest project completed was a $1,300,000 weapons test support facility at TA-3. The 24,858-square-foot structure consists of offices and laboratories, and is being used by Groups J-7, J-14 and J-16.

The cost figure given for this project and others that will be mentioned, is the amount budgeted for design, construction, equipment, utilities and modifications required by the using group.

Other projects completed include the 26,328-square-foot physics analytical center for $830,000. It consists of offices and an auditorium, and is used by MP division, P division and T-9.

Site preparations for the Los Alamos Meson Physics Facility (LAMPF), to include site grading,

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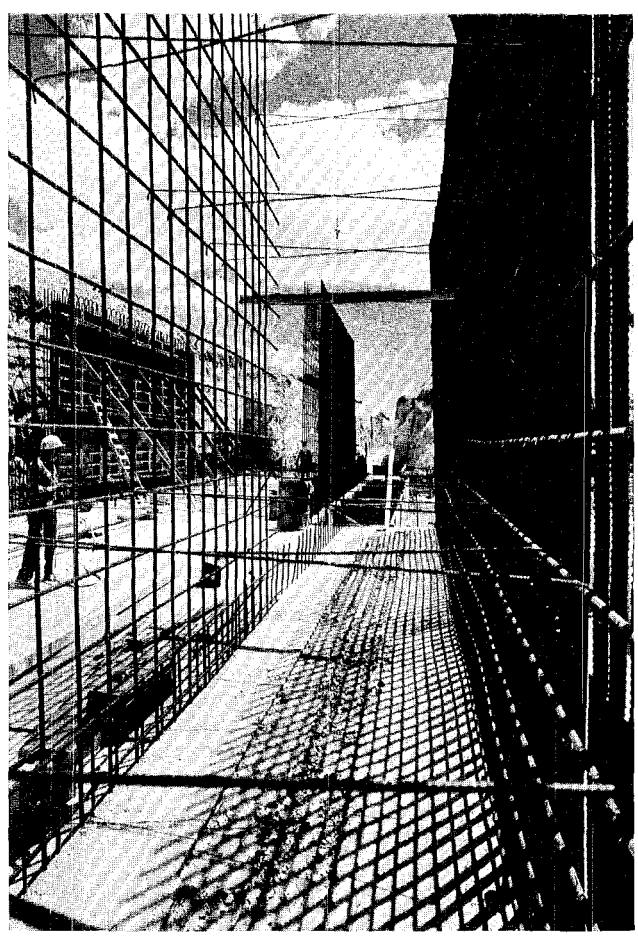
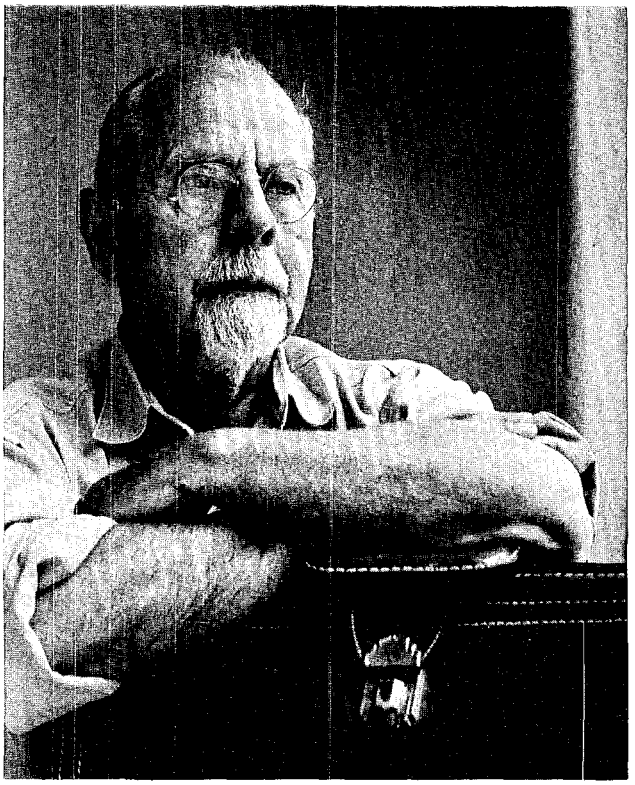


Steel work is in progress for the LAMPF Injector building and Alvarez section. A total of $2,300,000 is budgeted for the 46,500-square-foot facility.

"The Hermit Of Pajarito" Came Back



Dwight Young

The "Hermit of Pajarito Canyon" came back—for a little while.

Dwight Young, Caney Creek, Texas, a former staff member at the Los Alamos Scientific Laboratory attached to N division, returned to Los Alamos for a five day visit last month. He was dubbed "The Hermit" several years ago when he chose to live alone in a log cabin at Pajarito, to be near his work.

During his recent visit, Young continued research on some ruins, including a site in Pajarito Canyon which was excavated under his supervision in 1957. He plans to write and illustrate an article on them for publication.

He is also engaged in hurricane studies. This was another reason for his visit to Los Alamos. Mrs. Thelma "Mitzi" Thomas, N-2, had prepared some charts on storm occurrences for him, and he wanted to thank her for them.

In a letter to Mrs. Thomas, Young stated, "There is but one word to describe the charts. Beautiful. I have them mounted on a sheet of particle board and on my wall."

"Since you mentioned that some at Los Alamos were interested, I will give a somewhat fuller explanation. First, the reason for my interest. Some years ago, the National Safety Council used the slogan, 'Drive as if your life depended on it.' I am studying hurricanes as if my life depended on it. It does. In June 1957 there was predicted a hurricane to come ashore on a Thursday afternoon with a 5 to 8 foot surge. It came in the morning with a surge at one point of 13.9 feet. 500 people drowned. My floor is 10 feet above mean sea level."

"In science the discoverer of a new entity is usually allowed to name it, and he usually selects a name from a language with which he is familiar. There are alpha, beta, and gamma rays. When a new moon of Saturn was found recently the discoverer called it Janus. Bowen (E. G. Bowen of Australia) called the material he assumed caused rainfall "dust." I am not at all sure it is dust. By usual scientific standards I can justly be called almost illiterate. When an illiterate person finds

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short subjects

Two employes of the Los Alamos Scientific Laboratory retired in June.

Mrs. Annis L. Irelan, x-ray technician in Group H-2, retired June 28 after 7½ years with that group. Previously, she had worked for LASL as a casual for four years. Mrs. Irelan is a native of Couer d'Alene, Idaho. She will continue living in Los Alamos with her husband, Archie, who is a machinist in the LASL shop department. Future plans for Mrs. Irelan include working at her hobbies of oil painting and writing.

Philip J. Trimmer, machine operator in GMX-3, retired July 5 after almost 12 years with LASL. Born in Illinois, he lived and worked in southern California for The Harris Co. for a time, until coming to Los Alamos in 1950 to manage MB Jewelers. Three years later, he became owner of the firm. In 1956 Mr. Trimmer joined LASL and has worked in Group GMX-3 since. Trimmer plans to make his home in Harlingen, Texas.

Los Alamos County's annual United Fund drive will be launched Oct. 2, according to Chairman **Philip Reinig,** head of the engineering department at Las Alamos Scientific Laboratory.

Goal for this year's campaign will be $60,000, compared to $55,000 last year.

Reinig has appointed **Edward Voorhees,** CADP/C-DO, to conduct the campaign at the Laboratory; Gene Jones, president of the Los Alamos Building and Loan Association, the business community; and **Thomas Cook,** Zia Company. **Marshall Smith,** Zia Company, will be in charge of public relations.

Virden F. Hays, 46, CMB-7 mechanical technician, died July 2 in an Albuquerque hospital after a short illness. Hays, an employe of LASL since January, 1963, was born in Pocatello, Idaho. A veteran of the U.S. Army, he is survived by his wife, Donna, son John and daughter Judith, all of Santa Fe, and son Michael, who is with the U.S. Air Force.

Services were held in Santa Fe with burial in the National Cemetery there.

David Fine, J-9 at NRDS, has been elected chairman of the Las Vegas Section of the American Society for Quality Control.

Other officers elected were Walter R. Kazor, Westinghouse Astronuclear Laboratory, vice chairman; Stephen Proroczok, EG&G, Inc., secretary; and Lewis H. Cole, EG&G, treasurer.

Objectives of the American Society for Quality Control are the advancement of the theory and practice of quality control and of the allied arts and sciences, and maintenance of high professional standing among its numbers.

Los Alamos Scientific Laboratory will participate in the University of California's Centennial Caravan which opens at Berkeley Sept. 11.

The Caravan is a unique 12,000-square-foot traveling exhibit consisting of 74 panels and seven display wagons portraying 100 years of the University's history. It will be shown in nine of the state's cities during a two-month schedule, ending in mid-November.

LASL's display, designed by **Bill Regan,** Pub-1 group leader, will be in one of the wagons. It will feature a model of the Electron Prototype Accelerator, originally built by **Donald F. Sterner,** Eng-2, but refurbished by the SD-1 model shop under **Merle Carter** for the display. The model shop was also responsible for other construction necessary for LASL's showing.

Other items in the display will be a descriptive text about Los Alamos and the Los Alamos Meson Physics Facility; a back-lighted, three dimensional Laboratory logotype; and an illuminated, three-section panorama of Los Alamos and the Laboratory, photographed by **Bill Jack Rodgers,** Pub-1.

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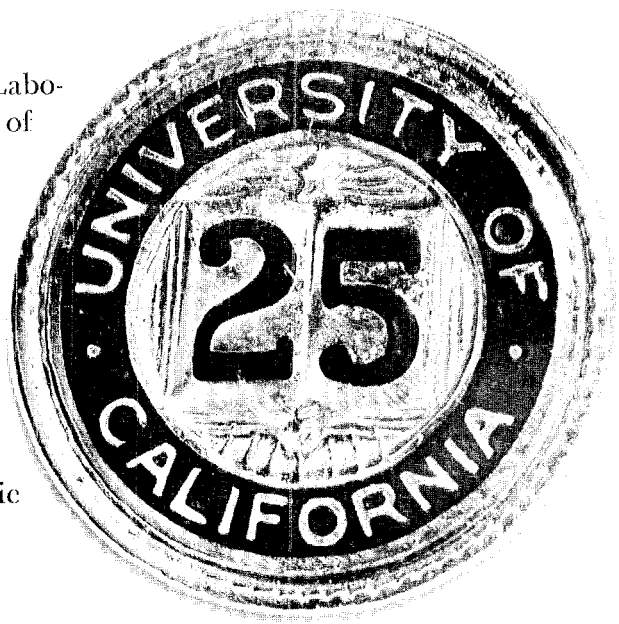
200 Receive Service Awards

Nearly 200 employes of the Los Alamos Scientific Laboratory were recently recognized for their years of service. Director Norris E. Bradbury presented each of them with a service pin, indicating 25, 20, 15, or 10 years of service.

Twelve employes were honored for 25 years. They were Harry S. Allen, SP-DO; Roland W. Davis, P-6; Russell W. Johnson, SP-DO; Wesley M. Jones, CMB-11; Joseph L. McKibben, P-9; Harold L. Newell, SP-4; Mary J. Sellers, SP-11; Richard F. Taschek, P-DO; Hugh O. Dubberly, SP-DO; Milton L. Grissom, Jr., AO-2; Robert I. Howes, SD-2; Charlie C. Stallings, Sr., Eng-4.



20 Year Pins

Receiving 20-year pins were 57 persons. They were Robert J. Albrecht, K-2; Lawrence Antos, GMX-3; Michael J. Archer, J-8; Nicholas P. Armenis, W-1; David B. Barton, N-2; James P. Bertino, CMB-8; Wilma M. Bruce, AO-2; Edward Casados, GMX-3; George E. Challenger, J-11; Anthony W. Coca, GMX-2;

Donald L. DeBoer, W-7; Bernabe Dominguez, W-1; Marjorie L. Dube, W-DO; Maximiano T. Esquibel, CMB-6; Tony J. Fresquez, SP-3; Eugenio P. Garcia, GMX-3; Robert B. Gibney, CMF-13; Raymond W. Gray, GMX-4; Bertram Heil, W-9; Donald E. Hull, CMB-7;

John E. LaBerge, GMX-8; Leonard S. Levinson, CMF-13; Burt J. McCloud, P-1; Duncan P. MacDougall, GMX-DO Vences Martinez, GMX-3; Richard C. Neal, N-3; Donald D. Phillips, J-12; Alfonso R. Quintana, GMX-7; Alan S. Rawcliffe, P-15; Joseph W. Romero, CMB-11;

Julie R. Rossiter, GMX-3; Viola G. Salazar, D-2; Thomas A. Sandenaw, CMF-13; Edward J. Sass, SD-5; Harry F. Schulte, H-5; John W. Schulte,

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Summer Employes at LASL Number 274

A total of 274 persons have been hired as summer employes at the Los Alamos Scientific Laboratory.

Most of them are college students, hired under annual summer employment programs, administered by Per-1 and Per-DO.

Under the Summer Vacation Replacement Program, for example, there are 136 college undergraduates employed. Miss Marianna Howenstine, Per-1 personnel representative, said that these persons work as clerks, draftsmen, data processing machine operators, technicians, health physics surveyors, handymen, cafeteria attendants and at other similar jobs.

The Summer Graduate Student Program employs 86, whose major fields of interest are in the physical sciences, engineering or mathematics. They are given an opportunity to become familiar with several phases of scientific research and development related to their fields of interest.

Mrs. Kathryne Lewis, Per-1 personnel representative, said that the Summer Graduate Student Program has proven to be a valuable recruiting device for the Laboratory. "As of Oct. 31, 1967," she said, "there were 114 persons permanently employed at the Laboratory, who at one time or another, were summer employes under this program."

For the first time, the Laboratory is participating in a Youth Opportunity Program. Forty-six 18-21-year-old economically disadvantaged youths, referred by the New Mexico State Employment Office at Espanola, are employed in many of the same areas as those persons hired through the Summer Vacation Replacement Program.

Bob Hayden, equal employment officer, said that another six youths are employed under a Special Youth Opportunity Program. These employes have completed their junior year in high school, and were selected on the basis of high science aptitudes. They are assigned to technical groups at the Laboratory.

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10 Year Pins

Receiving 10-year pins were 44 employes. They were Marion O. Allen, Per-1; Della Baldock, N-DO; Donald D. Bowdish, CMB-6; Theodore R. Crawford, J-8; Carl R. Cushing, K-2; Betty J. Edwards, J-7; Otis A. Farmer, N-4; Edward R. Flynn, P-10; Charles A. Folkner, T-1; Kenneth E. Green, CMF-13;

Mildred E. Hargrove, GMX-7; Walter F. Huebner, T-DOT; Virginia H. Johnson, H-1; Douglas R. Jones, SD-O; Elaine B. Lizut, H-1; Abedon F. Lopez, Jr., GMX-6; Richard H. Naffziger, GMX-3; Victor O. Romero, GMX-11; Jose L. Sanchez, Per-3; Jerald L. Sherwood, MP-3;

James W. Shore, CMF-13; Robert R. Showalter, J-16; Gordon M. Smith, J-12; Elmer J. Sowder, J-6; Casimir F. Stevens, J-10; Martin D. Torrey, W-4; Raymond D. Verre, CMB-11; Twilla R. Williams, H-7; James E. Young, T-9; Harley E. Lane, J-5/NTS;

Gilbert E. Andrus, CMB-7; Don H. Byers, W-7; William R. Field, GMX-11; Jack W. Haskins, SD-5; Robert Kandarian, MP-2; Harold M. Lederer, CMB-7; John A. McClary, N-7; Franklin Miley, CMB-11; Thomas A. Oliphant, Jr., P-18; Blanche L. Rochl, W-DO;

Joe N. Romero, SP-4; Peter G. Salgado, K-4; Milton W. Valenta, W-3; Russell J. Youngblood, P-1.

The Technical Side

Presentation at Bidders Conference on NAVSAT, Sandia, Albuquerque, N.M., June 4:

"Oxide Solid Solution Fuels for Space Electric Power Heat Systems" by J. A. Leary, CMB-11

Presentation at Fourth AIAA Propulsion Joint Specialist Conference, Cleveland, Ohio, June 10-14: (Classified Meeting)

"Use of an On-Line Computer in the Testing of Prototype Nuclear Rocket Engines" by J. B. Henshall, Edgar P. Elkins, and W. F. Carlson, all J-17, NRDS

Presentation at IMOG Joining Subgroup Meeting, Rocky Flats, Colo., June 11-12: (Classified Meeting)

"Basic Work in Electron Beam Welding" by G. S. Hanks and D. J. Sandstrom, both CMB-6

Presentation at Colloquium, June 12, and Seminar, June 13, at Department of Physics, University of British Columbia, Vancouver, Canada:

"The Dense Plasma Focus Experiments" by J. W. Mather, P-7

Presentation at Eighth Informal Conference on Photochemistry, University of Ottawa, Canada, June 17-19:

"Vibrationally Excited NO from the Flash Photolysis of NOCl" by R. Engleman, Jr., GMX-2

Presentation at Gordon Research Conference on Research at High Pressure, Meriden, New Hampshire, June 17-21:

"Metallurgy of Shock Loaded Iron Alloys and Its Application to a Meterorite" by E. G. Zukas, CMF-13 (Invited)

Presentation at Heat Transfer and Fluid Mechanics Institute, University of Washington, June 18:

"The Numerical Computation of Flow Fields" by R. A. Gentry, T-3

Presentation at Explosives Processing Committee Meeting, Livermore, Calif., June 18-20: (Classified Meeting)

"The Effect of Temperature Upon the Spark Sensitivity of Some Explosives and Molding Powders" by T. E. Larson, GMX-2

Presentation at Fourth International Materials Symposium, Berkeley, Calif., June 19-21:

"LEED Studies of the Polar (0001) Surfaces of the II-VI Compounds CdS, CdSe, ZnO and ZnS" by B. D. Campbell, CMB-8; C. A. Haque (Bell Tel. Lab.); and H. E. Farnsworth (Brown University)

Presentation at 22nd AEC Metallographic Group Meeting, San Diego, Calif., June 19-21:

"Metallography of U-Pu-C Sintered Pellets" by K. A. Johnson, CMB-11

Presentation at University of Denver Conference on Finite Difference Methods for Initial Boundary Value Problems, June 24:

"Generalized Finite Difference Schemes" by B. K. Swartz, T-1

Presentation at 15th National Conference on Campus Safety, Burlington, Vt., June 24-26:

"A Respirator Program for Teaching and Research Facilities" by E. C. Hyatt, H-5

Presentation at DASA-ARPA Conference on Nuclear Weapons Phenomena Pertaining to ABM Radar, Sandia Base, June 24-27: (Classified Meeting)

"Kingfish Late-Time Phenomenology" by D. S. Sappenfield, J-10 and Harold Linnerud (EG&G)

"Starfish Shock Front Simulation" by D. S. De Young, J-10

"Starfish Northern Conjugate Analysis" by H. W. Hoerlin, J-10 and John Buckner (EG&G)

"Checkmate Late-Time Phenomenology—Optical" by M. H. Peek, J-10; Marion Shuler and Ron Hubert (EG&G)

"Aircraft Observations on Haven Barter (Barium Releases)" by D. M. Kerr, Jr., J-10

"Two-Dimensional Simulation of Starfish-like Expansions across Field Lines" by C. R. Shonk, J-10

"Checkmate and Spartan Calculations" by D. S. Sappenfield, J-10

Presentation at Gordon Research Conference on Plasma Physics, Tilton, N.H., July 1-5:

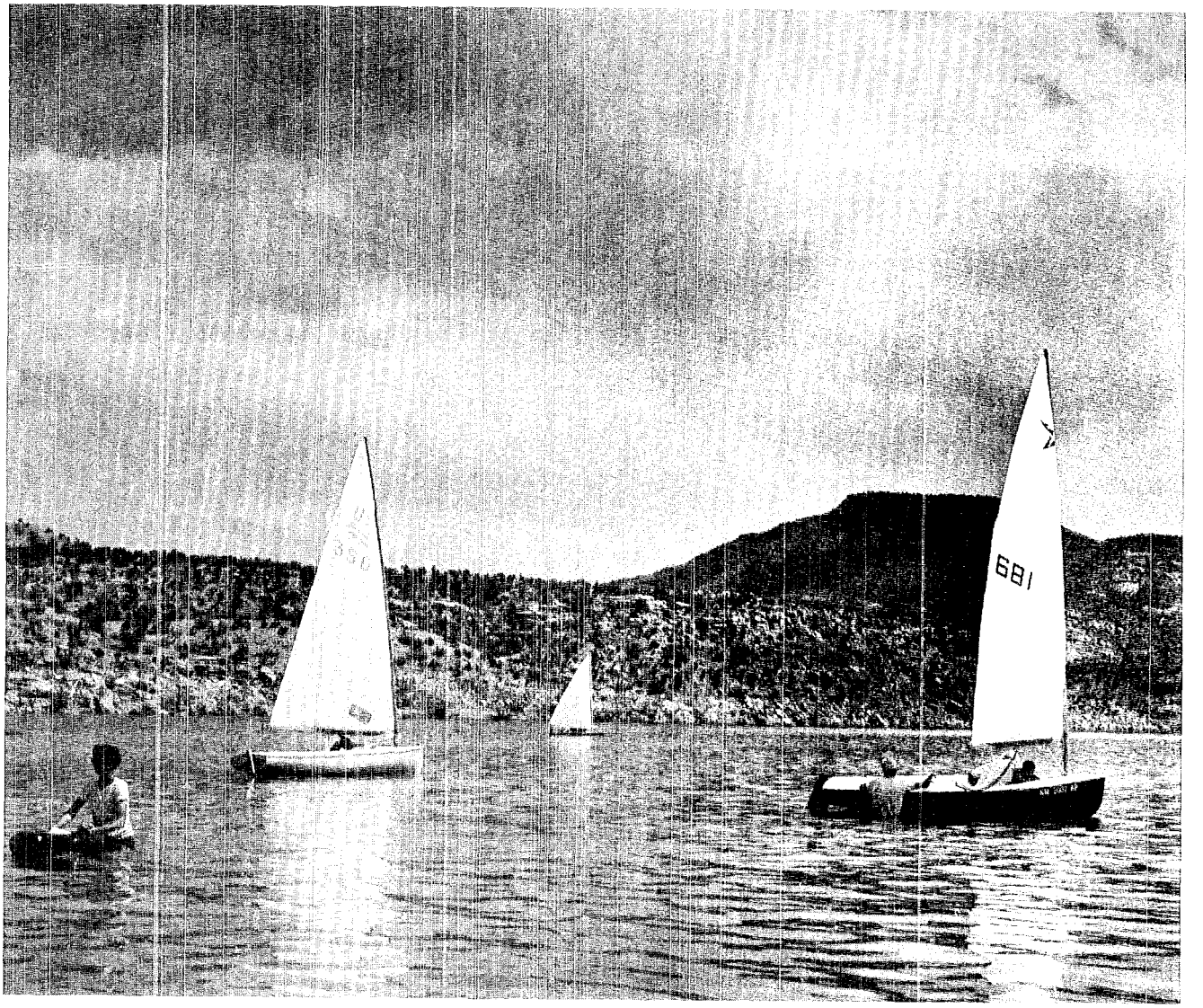
"Solar Wind Observations: Composition and Thermal Properties" by A. J. Hundhausen, T-12

Fifth Symposium on Fusion Technology, St. Catherine's College, Oxford (Culham), England, July 2-5:

"The Design of Scyllac, A 15-Meter Theta-Pinch Machine" by E. L. Kemp, P-16

Presentation at Meeting of the Rotary Club, Los Alamos, July 3:

"Some Health Physics Aspects of Nuclear Weapons Incidents" by W. H. Langham, H-4



Landlocked LASL sailors of the wind driven persuasion met recently at Abiquiu Dam for the first "sail in" of what may become an addition to the already long list of Los Alamos recreational organizations. More than 50 Los Alamos residents either have sailboats or have expressed interest in either building or buying one. Among those who attended the sail in were MP-3's Ed Bush who launched an Olympic racing class Finn (No. 260) and Bill Shlaer, also MP-3, who brought his Kite (No. 681), which served as headquarters for temporary commodore Peter Gram, MP-6, waist deep in water alongside. With inner-tube at left is Mrs. Don Cochran, whose husband works for MP-6. The photograph was taken by Mrs. Mary (Bill) Regan.

BACK COVER:

Dignitaries, taking part in ceremonies for Carroll L. Tyler, former AEC manager in Los Alamos, came to their feet with hands clapping after Tyler, second from left, accepted a special citation. The citation, presented by James T. Ramey, commissioner, Atomic Energy Commission, (shaking hands with the recipient) recognizes Tyler's outstanding contributions to the nation's nuclear weapons program during the critical years following World War II. At left is James E. McCormack, chairman of the board, Communications Satellite Corporation. At right are Norris E. Bradbury, director of the Los Alamos Scientific Laboratory, and Herman E. Roser, area manager for the Los Alamos office of the AEC.